

## REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons which follow.

### *Introduction*

Claims 1-15 are pending in the instant application. Applicants have amended claims 1, 11 and 15 to correct a clerical error and to define the claimed invention more specifically with a technical feature. No new matter has been introduced.

### *Amendment of the Specification*

The instant application was filed claiming a foreign priority to Korean patent application No.10-1999-0046220 filed October 23, 1999, and its contents are incorporated by reference in their entirety into the instant specification.

Applicants, however, found that the current specification does not correctly reflect the contents of the parent Korean application due to a clerical error occurred in translating a Korean text to an English one. In particular, although the Korean application correctly stated that "alkaline solution of pH 8 to pH 12 which contains more than 1M of salts," the reference to "1M of salts" has erroneously changed to "1 mol of salts" during the translation. A certified copy of an English translation of the Korean application, which will be followed, clearly evidences that "1M of salts" are described in the Korean application originally filed. The instant specification incorporates the contents of the Korean application by reference, and thus the change of "1 mol of salts" to "1M of salts" based on the Korean application does not introduce new matter.

In addition, applicants also have revised several parts of the specification based on the original Korean application. The certified copy of the English translation of the Korean application will show that such revisions are supported by the original application and do not introduce new matter.

***Claim Rejections***

**Rejection of Claim 15 under 35 U.S.C. §112, first paragraph**

The examiner has rejected claim 15 as non-enabled. While acknowledging that the claimed by-product would contain nitrogenous waste that is a crucial component of fertilizers and soil manures, the examiner questions the fertilizer quality of the claimed by-product because it would contain high concentrations of salt. Applicants respectfully traverse the rejection.

At the outset, applicants wish to draw the examiner's attention to the amended claim 15 that recites specific salts, namely, sodium nitrate and sodium phosphate, to be used in the recited DNA isolation method. Nitrogen and phosphate ions are well known as primary nutrients for plants, and thus have been commonly used as components of inorganic fertilizers. In addition, sodium nitrate itself has long been used as a fertilizer for plant growth.

The examiner cites two publications, Davidson et al. and Shukla et al., to evidence that salt-affected soils are adverse to the growth of plants. These publications teach the impacts of salinity of soil on plant growth in general. However, these publications provide no teachings or suggestions as to the effects of salts of nitrogen or phosphate on plant growth. More specifically, there is no teaching or suggestion from which a person skilled in the art would infer that the source of nitrogen and phosphate would be harmful to plant growth, and thus cannot function as a fertilizer, because potential ionic effects. Rather, if following the examiner's rationale as it is, all inorganic fertilizers currently used should be questioned about fertilizer effects, of their adverse salt effects.

*do suggest*

*need showing that salts of nitrogen or phosphate do not*

Applicants' specification is presumed to be enabling, absent objective evidence to the contrary. Thus, the examiner bears the initial burden of proffering either objective evidence or sound scientific reasoning to explain why the claims are not supported by an enabling disclosure. However, the examiner, has failed to this burden in the instant case because the cited publications the examiner relies on this action do not substantiate that a person skilled in the art most likely would question as to the

fertilizer quality of the claimed by-product notwithstanding their capability of providing the primary nutrients of plants.

Therefore, applicants respectfully submit that one skilled in the art would readily recognize the use of the claimed by-product based on its function of the source of nitrogen or phosphate, without undue experimentation.

Accordingly, in view of the amendment of claim 15 together with the above arguments, applicants respectfully request reconsideration and withdrawal of the enablement rejection.

*Rejection of Claims 1-15 under 35 U.S.C. §112, second paragraph*

The examiner has rejected claims 1-15 as allegedly indefinite due to the recitation of "1 mol." As the examiner also indicates, applicants intend to claim the use of a high concentration of salts in the claimed method, which is more than 1 M. As explained above, however, applicants found that the instant application erroneously recites "1 mol," instead of "1 M." Such an error occurred during the translation of a Korean text of a parent Korean application to an English one. However, because the Korean text is incorporated by reference into the instant application, applicants correct this error in claims 1 and 11, as well as in the relevant parts of the specification, by changing the recitation of "1 mol" to "1M," based on the Korean text. A copy of the certified translation of the Korean application will be followed to further evidence that the amendment is supported by the Korean application.

Applicants respectfully submit that the amendment of claims 1 and 11 render moot the rejection, and thus request the withdrawal of the rejection.

*Rejection based on Double Patenting*

Claims 1-15 have been rejected under the judicially created doctrine of obviousness type double patenting over claims 1-20 of copending application No. 09/693,862. Because applicants cannot evaluate this rejection until the nature of the allowable claims in the present application are known, applicants defer addressing this rejection until the claims in the instant application are found otherwise allowable. Thus, applicants respectfully request that this rejection be held in abeyance.

In view of the foregoing amendment and remarks, applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

Respectfully submitted,

Date 20 May 2002

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**VERSION SHOWING MARKED UP CHANGES**

**In the Specification:**

**On page 2, delete the last paragraph starting from line 24 and replace it with the following in accordance with 37 CFR §1.121:**

These and other objects of the present invention can be achieved via a method for obtaining DNA from fish spermatogonium that comprises:

- i) disrupting a fish spermatogonium to produce a milky-white colloid containing DNA;
- ii) treating the milky-white colloid with alkaline solution of pH 8 to pH 12 which contains more than 1 [mol] M of salts, such as a monovalent salt, to separate DNA from nucleosome; and

**On page 3, delete the first paragraph ending at line 11 and replace it with the following in accordance with 37 CFR §1.121:**

- iii) precipitating DNA by adding ethanol to the mixture obtained in the step (ii).

The above objects of the present invention are also achieved by providing a method for obtaining DNA from fish spermatogonium, which comprises:

- i) disrupting a fish spermatogonium in an alkaline solution of pH 8 to pH 12 which contains more than 1 [mol] M of salts, such as monovalent salts;
- ii) adding an anhydrous compound to the disrupted spermatogonium mixture obtained in the step (i), to effect acylation reaction;
- iii) precipitating DNA by adding ethanol to the acylated spermatogonium mixture.

On page 4, delete the first paragraph ending at line 9 and replace it with the following in accordance with 37 CFR §1.121:

Fish spermatogonium is disrupted by crusher in distilled water to produce colloid mixture. The colloid mixture is filtered through sieve to eliminate tissues which were not crushed, and then an alkaline solution with high salt concentration is added thereto. Also, fish spermatogonia may be disrupted in an alkaline solution with high salt concentration, or may be disrupted in distilled water [and] followed by adding high salt concentration solution, and an alkaline solution of pH 8 to pH 12 is added thereto, sequentially. High salt concentration solution is understood to have more than 1 [mol] M of salts, more preferably not less than 4 [mol] M of salts.

Delete the paragraph bridging between **pages 4 and 5** and replace it with the following in accordance with 37 CFR §1.121:

Hereinafter, the methods of the present invention will be described in more detail. [Protamines are separated from DNA upon being positively charged strongly by virtue of highly concentrated salts. The protamines contain a large amount of lysine.] Upon disruption of cells, highly concentrated salts impart a strong positive charge to DNA binding proteins, which enables DNA binding proteins to be readily separated from DNA. DNA binding proteins such as protamines have a high content of lysine. Lysine contains an amine group [and] that can be positively charged by highly concentrated salts. Amine groups [of the protamine] with a positive charge in DNA binding proteins, can be deprotonized by alkaline solution to form highly reactive functional groups, which can react with anhydride resulting in loosing ionic affinity toward DNA (Roger L. Lundbland and Claudia M. Noyes., chemical Reagents for Protein Modification, Vol I CRC Press, Inc., 1984, page 130 -131; Riordan, J. F. and Vallee, B. L., Acetylation, Meth. Enzymol., 11, page 565-570, 1967). Moreover, alkaline solution of the present invention is able to cause lysis of RNA. Therefore, DNA can be obtained without using RNase using the method of the present invention.

On page 5, delete the first full paragraph starting from line 3 and replace it with the following paragraph:

Upon reacting of the deprotonized amine group with anhydride, the amine [group] groups of the [protamine] protein and of RNA [is] are acylated loosing a positive charge and then, the [protamine] protein is not combined again with DNA under a low concentration of alkaline salts. Then, DNA is precipitated in fibrous form from the reaction mixture by addition of ethanol thereto. The DNA thus obtained is washed with ethanol and dried to produce a white DNA fiber. In order to make manure from the by-product of the above process, nitric acid or phosphoric acid equivalent to the base used in the process of the present invention, is added to the by-product mixture and then distilled simply after adjusting pH of said mixture to neutral.

**In the Claims:**

In accordance with 37 CFR §1.121, please substitute for original claim 15 the following rewritten versions of the same claims, as amended. The changes are shown explicitly in the attached "Version with Markings to Show Changes Made."

1. (Once Amended) A process for obtaining deoxyribonucleic acid (DNA) from fish spermatogonium, which comprises:

i) disrupting a fish spermatogonium to produce a milky-white colloid containing DNA;

ii) adding an alkaline solution of pH 8 to pH 12 that contains more than 1 [mol] M of salts to said milky-white colloid to separate DNA from protamines;

iii) adding ethanol solution to the mixture obtained in step ii) to precipitate DNA.

11. (Once Amended) A process for obtaining deoxyribonucleic acid(DNA) from fish spermatogonium, which comprises:

i) disrupting a fish spermatogonium in an alkaline solution of pH 8 to pH 12 that contains more than 1 [mol] M of salts;

ii) adding ethanol solution to the mixture obtained in step i) to precipitate DNA.

15. (Once Amended) A liquid manure comprising the residual by-product solution after separation of DNA from the solution obtained by disrupting fish spermatogonium and then treating by alkaline solution of pH 8 to pH 12 that contains more than 1 M of salts, wherein said salt is selected from the group consisting of sodium nitrate, and sodium phosphate.